ILLUSTRATED CATALOGUE

—OF—

WIND-MILLS,

PUMPS, TANKS. ETC..

—MANUFACTURED BY—

B. S. WILLIAMS & CO.,

KALAMAZOO, MICHIGAN,

U. S. A.

AWARDED OUR MILL

"As a Strong, Durable Engine, not liable to get out of order."

INTRODUCTION.

KALAMAZOO, MICH., July 1st, 1884.

In presenting another edition of our Catalogue, we would again thank our numerous friends for their constantly increasing trade and influence. Starting business many years ago in a small way, and at a time when it was a rare thing to see a Wind-Mill, our trade has increased from year to year, until nearly every State and Territory has our Mills in operation, and the past season many places where we had the best local demand was *where our Mills had been in constant service from eight to twelve years.*

Our sole business is manufacturing Wind-Mills,—we make no other machine or tool to divide our attention or interest, hence we have constantly kept to the front in improvements; and we place our Mill on the market knowing it is equaled by few, if any, and excelled by none.

Dating from the Centennial year, our foreign trade has increased from a few sold that year until now it is not an infrequent thing to be packing from one to three car loads destined for Australia, South America, Africa, etc.

We still continue to make the OLD RELIABLE STOVER, with all its improvements, for any who prefer that truly desirable Mill, which we have made so many years. But all Mills embraced in this Catalogue are of the popular style bearing our registered trade mark, "MANVEL." We have observed with pleasure the free notices given B. S. WILLIAMS & Co. by some who, through misrepresentations, seek to build up their own business by damaging us; and we would extend our thanks for the gratuitous advertising received from those who, while claiming to make better Mills than ours, and attempting to expose what they imagine to be the defects of our Mills, are continually exposing quite another affair. We have neither the time, space, nor desire to enter into any controversy, or to "show up the defects" of other Mills, possessing, as we do, in our own quite enough excellent features to occupy our attention and satisfy buyers. Should anyone reading this be in need of a convenient water supply for *Farm*, *Garden*, *Dairy*, *Private Residence*, *Brick Yard*, *Hotel*, *Livery Barn*, or other purpose, we would request such to follow us through these pages, and if any point is not clearly illustrated, write us for further information.

Will it pay a Farmer, Dairyman or Stockman to Buy?

If a Stockman or Dairyman has to spend 30 minutes each day pumping water for his stock, or driving them to a pond, pool or creek, how many days of the average length does he spend each year in supplying his stock with water.

If a Dairyman has to drive his cows to a creek or pond in winter, are they not liable to be injured by slipping or getting cast in deep snow banks? and after being driven to this watering place, do they not fill themselves with enough *ice wqter* to last them 24 hours, which of itself is an injury.

If this pumping or driving had to be done the same as harvesting or planting, how long would it be before *something* would be bought to perform this labor?

If it is worth from five to ten cents per day to pump water for stock or drive them to some special point, a complete and permanent water supply for house and stock, at different points, can be put in and the above sum pay a good percentage on the investment in the saving of labor alone. The Stockman or Dairyman can estimate the advantages of pure water at any time on his stock above the saving in labor.

If the Dairyman has plenty of pure, clean water for his cows to get when they want it, and all they want, what percentage, in quantity of milk, has he over the Dairyman whose stock obtain water by having it pumped for them, or being driven to a watering place, which must be, at the best, at irregular intervals?

If the Dairyman, with plenty of pure water has a percentage in quantity of milk, has he not also a percentage in quality over others?

Can the quality of butter or cheese be affected by impure water?

Is it not true that the best cow in the dairy for milk, the best steers, or the best sheep in the flock, to take on flesh, are generally those of the most quiet and peaceful dispositions, and stand the poorest chance of getting what they want when driven to water in a body?

Can a man fatten cattle, sheep or hogs economically without water before them all the time?

Does not the Dairyman and Stockman himself need more water some days than others, owing somewhat to the food he eats, the temperature and condition of the atmosphere?

If the above is true, why will not the same thing apply to stock of all kinds?

Bear in mind that your spring of water, off from 20 to 100 rods, or your well water from any depth, can be forced through milk house or creamery and thence to the fields for stock.

How Constructed.

In explaining the construction of our Mills, we have purposely avoided the too-common method of dwelling so much at length on any fine theories or principles, which may be interesting to the mechanic who has given years of study and experimenting to this class of machinery, yet the majority of those who use Wind-Mills can give but little thought to these theories, and will often be more confused than enlightened by them, and in many cases this seems to be one of the main objects sought; another being to impress the reader with the idea that an immense amount of wisdom and ingenuity had been expended in constructing the particular Mill whose merits were being set forth. But it by no means follows that the most complicated Mill is the best: the exact reverse, in most cases, being true, and a few plain, practical points which we shall endeavor to clearly set forth, is all that is necessary to be understood in order to decide upon the merits of a Wind-Mill.

We make what are known as "Solid Wheel" Mills, having the fewest possible joints to get out of repair, and being governed by the *whole wheel* turning, instead of the sections tilting separately, as is done by what are called "Open Wheel" Mills. It is held to its work by a moveable weight, the raising of which by the wind's pressure causes the wheel to assume a position in which it receives the wind less directly, and during a very severe gale it presents the least possible surface exposed. We think it speaks well for our Mills, that some who seem unable to find any fault in them, should advertise our excellent features by attempting to ridicule this one. We guarantee all Mills made by us to run in as high wind as any purchaser desires, and most people will probably agree with us, that foolhardiness is no more commendable in running a Wind-Mill than it would be in sailing a vessel during a storm when unnecessary, simply because both happened to be strong enough to stand it.

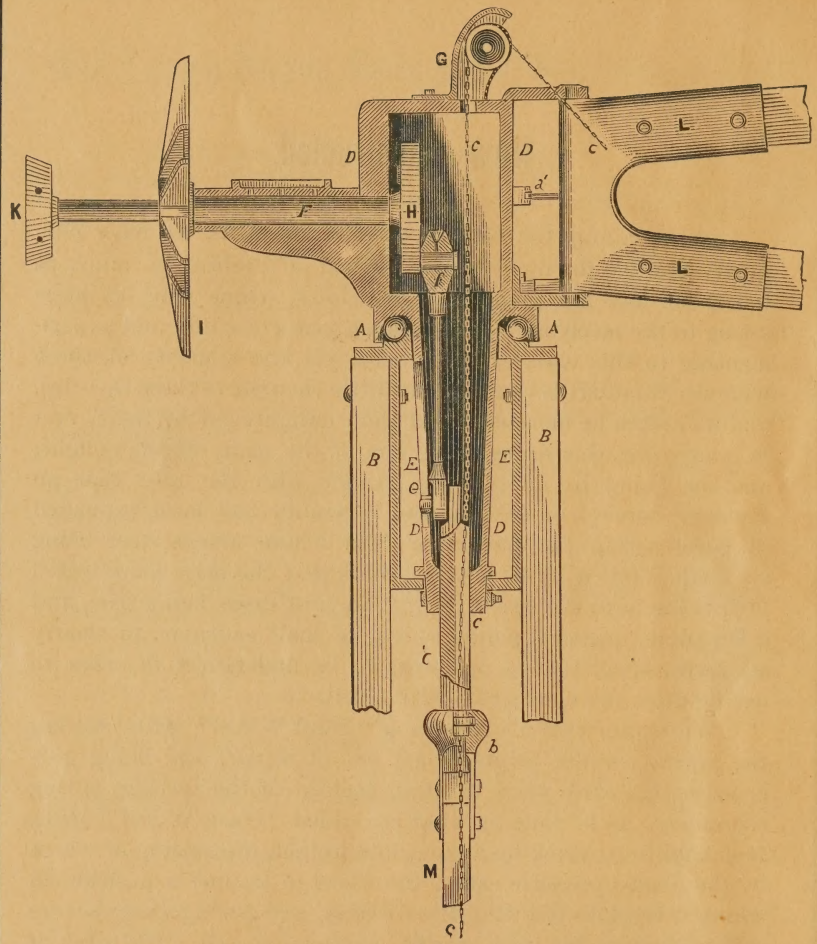


FIG. 1.

Fig. 1 shows a vertical section of the iron parts of the MANVEL. At AA are seen the anti-friction balls, of which there are sixteen, and on them rests the entire weight of the Mill, thus enabling it to adjust itself to the changes of wind very easily, and with practically no friction. This is very important. In fact, the turn-table has properly been termed the vital part of a Wind-Mill. If defective here, the defect is quite liable to prove fatal to the entire Mill. The ease with which the Mill can shift and adapt itself to the sudden changes of the air currents in a storm, measures, to a great extent, the capacity of the

Mill to protect itself and come safely through, and also helps to increase the power of mill for work in a light breeze, by enabling it at all times to stand squarely before the wind, and thus receive its full force. Our Mill is not only very sensitive on its turn-table, but it has also a broad, firm bearing, and for durability cannot be excelled, these parts being made of hard chilled iron. It will also be observed that the position of the balls on their bearings, together with bearing of Mill on the balls, is such that the main casting will always be held in an upright position, thus preventing any friction around the sides of main casting, where it passes through the turn-table, just below the balls. DDDD are different points on main casting, and EE the turn-table. BB is the wooden mast to which the turn-table is bolted. F is the main shaft. I is spider to which the arms of wheel are bolted. K is saucer-shaped casting to which head braces are attached. G is chain-pulley casting, and CCCC chain by which Mill is pulled and held out of wind when not in use. LL is vane-hinge, to which vane is bolted. H is the edge of crank-plate, which brake engages when Mill is at rest. "f" is upper end of pitman, with pitman-pin passing through it. The lower end of pitman is attached to upper end of plunger in same manner, making as simple and direct a connection as it is possible to make, and a better or more durable one has never yet been devised. At b is seen the method of constructing swivel-joint, the chain passing through center of same. M is upper end of wood pitman, which reaches to pump. "a" shows end of brake, and a portion of rod that connects same to vane-hinge.

The entire working parts of our Mills are encased, thus preventing any snow, sleet or dirt from lodging therein, and also improving its appearance. These covers have been added to please many of our customers who prefer this style, although our Mill has so few parts, and is so simple in construction, as to make casing much less essential than on Mills that are more complicated. For simplicity, durability, and handsome appearance, we claim our Mill is unexcelled.

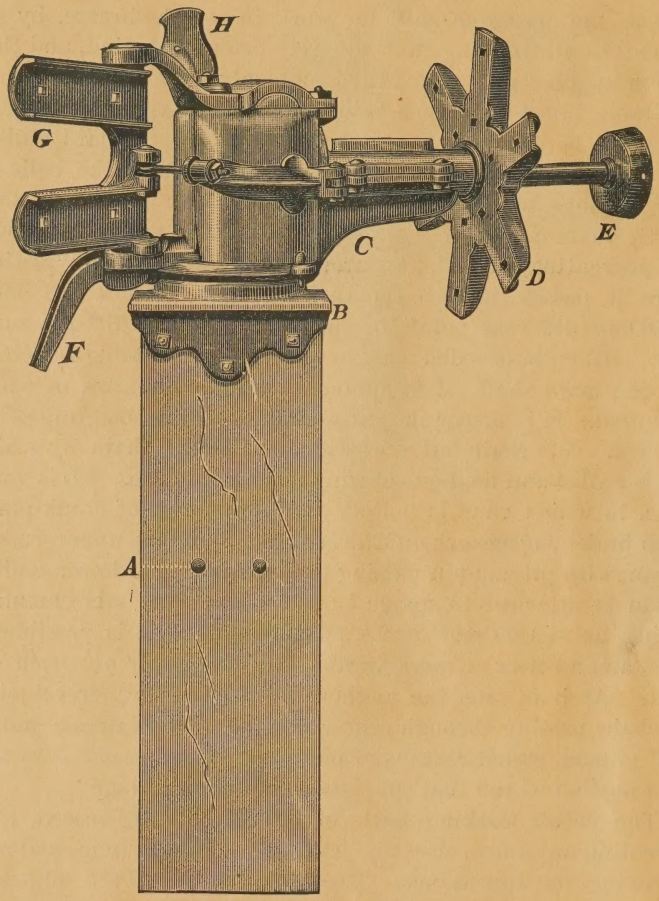
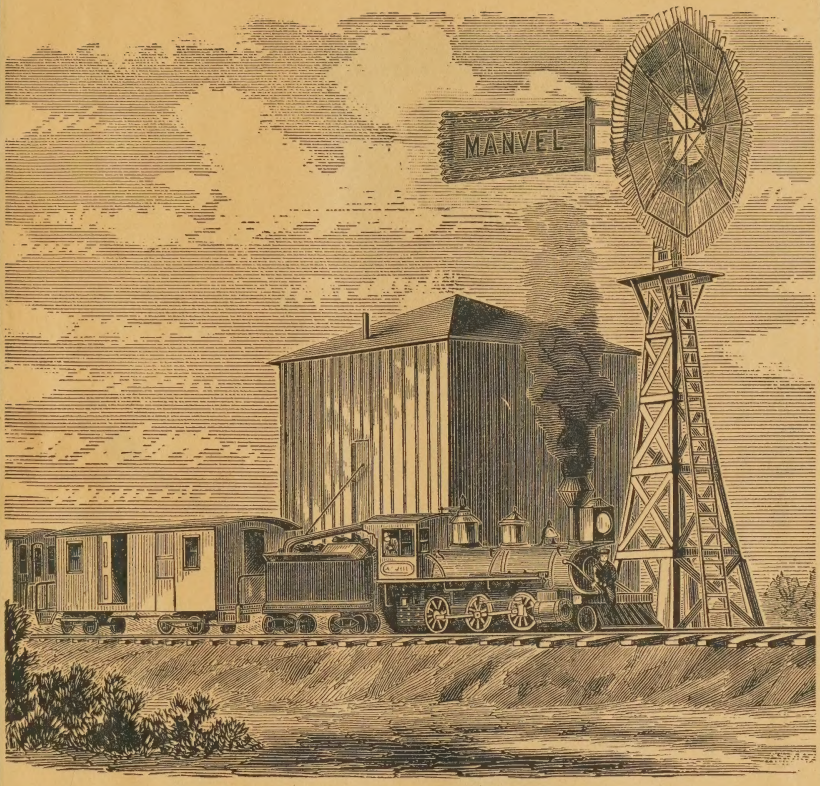


FIG. 2.

Fig. 2 gives another view of the iron parts of the MANVEL, mounted on mast, or upper part of tower. A is the mast, and B the turn-table, bolted to same. Just above C is where brake is hinged, so that when Mill is thrown out of gear, a brake-shoe is drawn against edge of crank-plate. A rubber cushion behind opposite end of brake gives an elastic pressure on same. F is the lever hinge to which bar carrying graduating weight is attached.

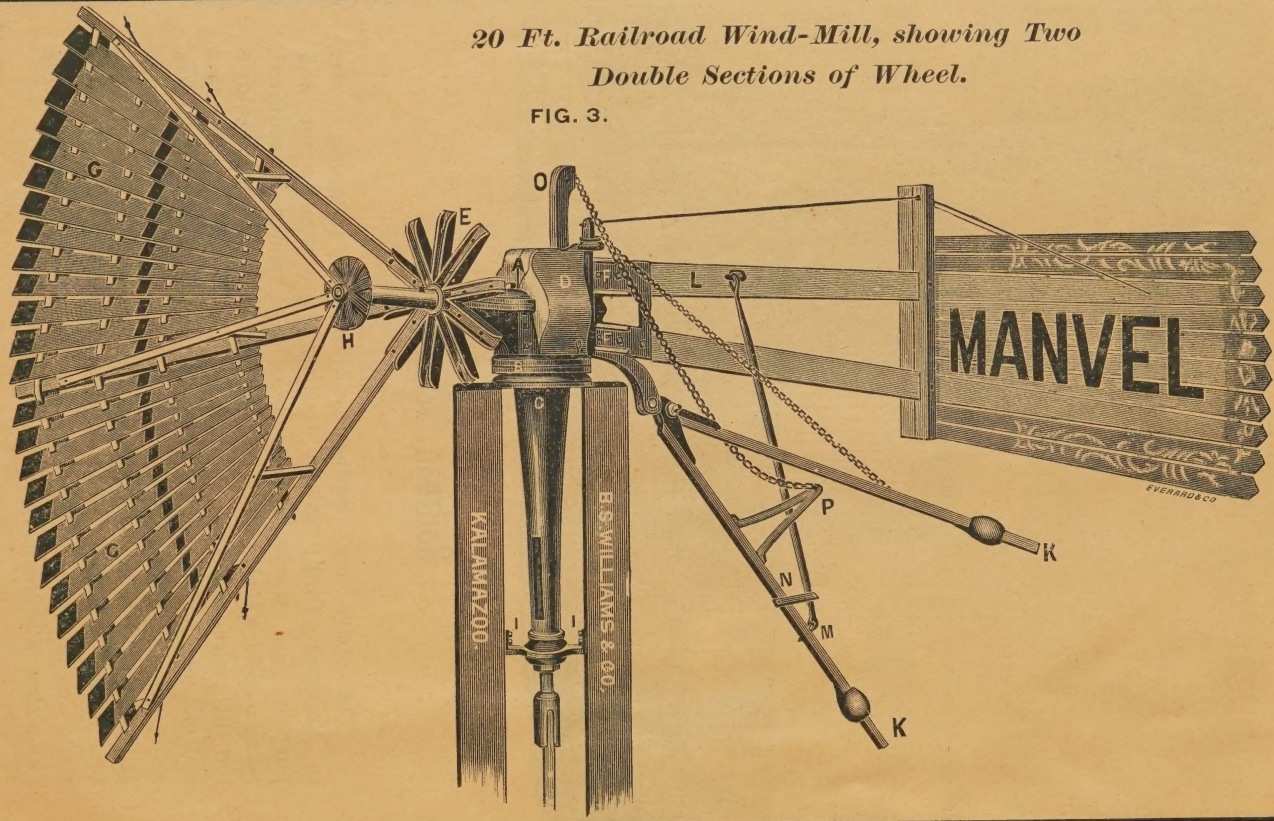


Railroad Wind-Mill.

The above cut represents Wind-Mill pumping water in Railroad Tank; it is decidedly pre-eminent for this purpose, and where a large amount of water is required, being a solid wheel, and having but three or four parts, requires but little care, and is not liable to get out of order—points that railroad men and managers will appreciate; 14, 16 and 20 foot Mills are the sizes most used for this purpose. These large Mills have a double governor, and they work with a regularity that is not equalled. Printed instructions how to erect these Mills are furnished. We also furnish the best double-acting pump that is in the market, for railroad purposes.

20 Ft. Railroad Wind-Mill, showing Two Double Sections of Wheel.

FIG. 3.



Description of our 20 Foot Railroad Wind-Mill.

In the construction of our large Mills, as in the smaller ones, we aim at simplicity, durability, and thorough adaption to the work required; the difference consisting largely in heavier parts, with double governor and double sections.

A, B, and C, Fig. 3, show the main casting, which is heavy and strong. Immediately under B are chilled balls, on which the entire Mill rests, giving it a turn table without friction, the cap B covering them from sleet and ice. D is the cover enclosing crank and connections, and if any other device can give a more direct and simple way to get stroke to pump than the way shown, we have yet to find it out. E is the spider or hub, to which arms are fastened; F, the vane hinge; G, the sails; H, where the arm braces are fastened; I is the collar holding lower part of main casting in place; just below is swivel joint, which is a very simple joint to draw on, and at the same time a swivel, allowing the Mill to change with the wind. KK are the governors, and as the wind increases in its pressure it raises one, raising it until the strap just below N catches the other governor. The governors are so hung that as the wheel folds in with the vane they are raised and lowered by an increased or diminished pressure of the wind, so that in a gale this Mill will not run faster than in a high or ordinary breeze. This is the important point in any Wind-Mill, and we make the broad claim that, resting on anti-friction balls, with our governor of varying resistance, our Mill will govern better than any can with the weight of the machine resting on an iron surface or turn-table of two to four inches, for at every change of the wind the Mill has to grind around to get out of the wind, and after a time cuts out on the side where the prevailing winds hold it most of the time, and the wheel then lops over against the tower. Between L and M is the rod running from governor to vane, and is hinged into governor and vane. This vane, of course, remains in line with the wind. Now, as we stated before, the wind pressing against the wheel gradually, as wind increases, folds it around in line with vane, or edgewise to the wind. The wind diminishing, it comes back to receive the wind, all the while keeping up a regular, uniform motion that conduces to the wearing qualities of the Mill and also the pump.

MR. A. B. ALMOUR, Halifax, N. S.— DEAR SIR: In reply to your inquiry concerning the working of the B. S. Williams & Co. Wind-Mill that you erected, it gives me pleasure to say that, after a thorough test against severe frosts and storms and light winds, it has proved everything we could wish it to be, and does all that you represented it would. The arrangement for hand pumping, in case of dead calms, is also perfect, as well as the arrangement for throwing it out of gear. It does away with the expense of one man, as it only requires to be oiled once or twice a week, and one of the section men or station masters, attend to that. Our tank is 10 feet in diameter and 11 feet high. It will fill the tank in four hours with a moderate wind, or 3,000 gallons per hour. I can with confidence recommend it, particularly for railroad purposes, or for any purpose where there is a large amount of pumping required.

Yours very respectfully, JAMES YOE,
Road Master Inter-Colonial Railway.

P. S.—The above is one of your sixteen-foot Mills, with a double-acting pump of two-inch suction, and of the same discharge.

Illustration,—Plate 1.

On the opposite page we show what at first seems only a handsome landscape; but we would call attention to a few points which add, not only to the attractions, but also to the convenience, of the surroundings. Directly under the Wind-Mill, and within the enclosed tower, is seen one of our Pumps, Fig. 736, drawing water from well. From bottom of this pump is pipe, shown by dotted lines, leading under ground, so as to be below the action of frost, to tank over rustic summer house, on a knoll. This is elevated sufficiently to form a head of water that may be used for running fountains, sprinkling lawn, and various other purposes; following the course of pipe under ground again, back of well and back of cistern, under porch, and up through the floor of house to sink in kitchen; it is seen terminating in a faucet, and by simply turning this a supply of well water is at all times had in the house.

Just above the pump in tower may be observed what is called a triangle. From this extends a horizontal rod to a similar triangle on back porch of house; under the porch is one of our Pumps, Fig. 514, which sets over a cistern. By simply inserting a pin in triangle in tower, this pump is connected with the Wind-Mill, and when in operation elevates water through pipe leading to round tank in attic; from this tank is a pipe leading down, and terminating in another faucet over sink, which supplies soft water in kitchen. Higher up in same pipe is placed a faucet supplying water to bath tub in chamber. Either of the pumps shown may be operated separately, or both may be worked at same time.

The details of such a job may be changed in a great variety of ways; the object being to show here the general plan for operating two pumps with a single Mill, for the purpose of supplying both hard and soft, or well and cistern water; one of our 10 or 12 foot Mills being large enough to supply an ordinary residence and grounds. If, however, the grounds were large and a large amount of water required, a larger Mill should be used. These triangles are also frequently used where only one Pump is required, if for any reason the Mill and tower cannot be set directly over the well; or if well is not more than 25 or 30 feet in depth, the Mill may stand one side, with pump directly under it, with pipe leading horizontally to, and down in well, thus forming what is known as a side draft or side suction.

As hardly any two jobs are alike in detail, estimates of cost can only be furnished on application, stating requirements near as possible.

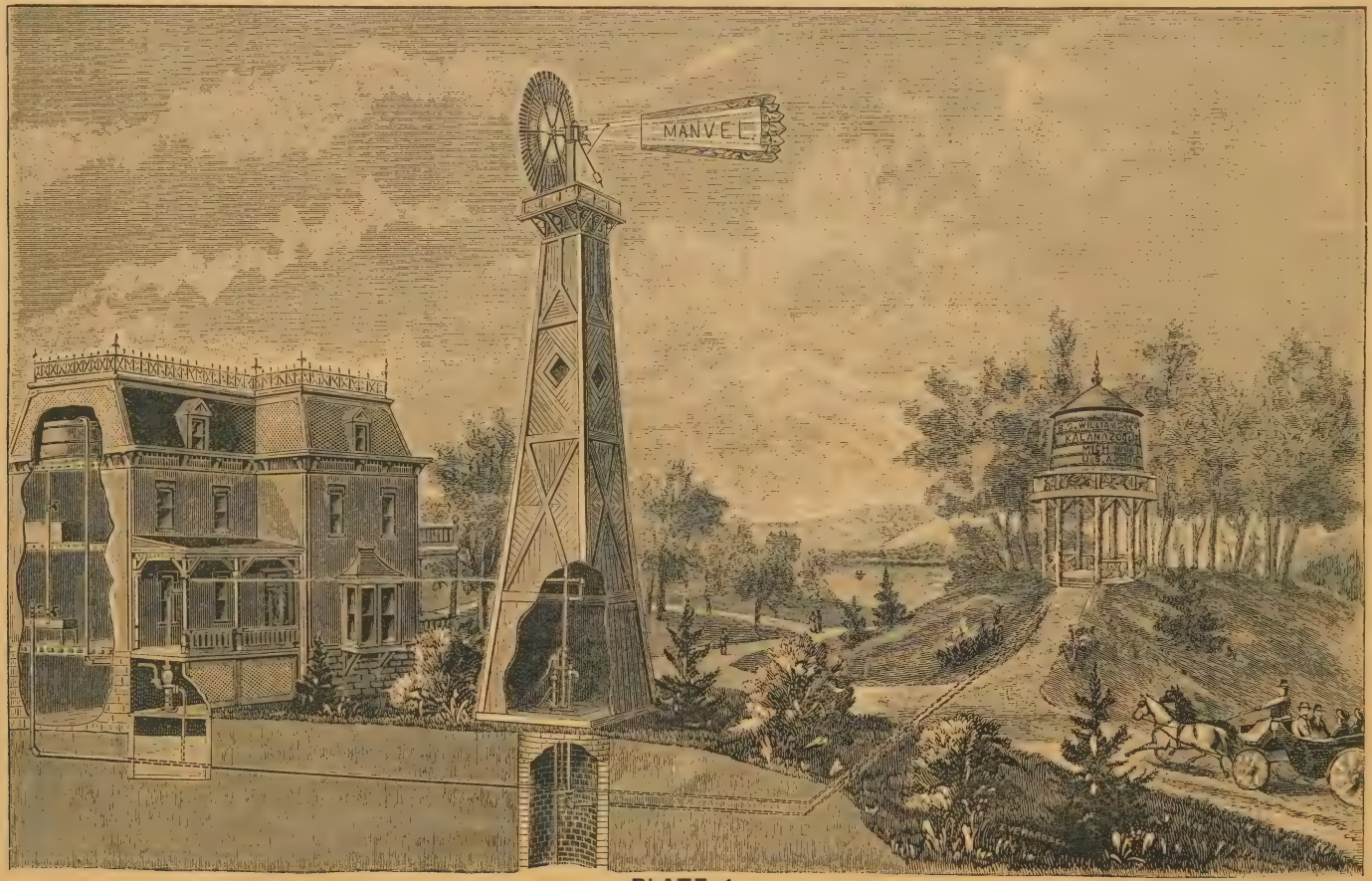


PLATE 1.

Power of the Manvel Wind-Mill.

We are often asked about the power of our Mill. This is difficult to state accurately, on account of so many varying circumstances, that must be taken into consideration.

The power is derived from the wind, which changes not only in its velocity, but also in the density of the air. The location of Mill, also, has often much to do with its power, owing to the uneven currents of air. The distance which power has to be transmitted will make a difference in results obtained. In this connection, will be liable to arise intricate questions of friction and leverage; and so we might continue enumerating the difficulties that render it nearly or quite impossible to give the exact power of a Mill, which, indeed, will vary in the same Mill under dissimilar circumstances; but, for reasons already stated, it can be seen that tables purporting to give the power of Wind-Mills are not. and from the very nature of the case, cannot be at all times reliable, and are really of no use except to show approximate or average results under the most favorable circumstances; while practically an allowance of 10 to 20 per cent. should be made for the varying conditions, some of which we have named. We guarantee our Mills equal in power to any, and rate them about as follows:

10 foot Mill ----------1-2 to 1 Horse Power	16 foot Mill ---------2 to 2 1-2 Horse Power
12 foot Mill ------- 1 to 1 1-2 Horse Power	18 foot Mill ---------2 1-2 to 3 Horse Power
14 foot Mill --------1 1-2 to 2 Horse Power	20 foot Mill ----------3 to 4 Horse Power

We are aware the above is rather a modest claim compared with that of many manufacturers who announce, and some even pretend to guarantee their mills to have *more* power than any other. Knowing this cannot be true of all who claim it we prefer to let our Mills speak for themselves, and only ask examination and comparison, or inquiry from those using them. It must be apparent that a given amount of wind pressure on a given surface will produce about the same effect on one mill as on another, provided both are constructed on reasonably correct principles, the main difference arising from the greater or less power consumed by friction or complicated leverage. With all our working joints as nearly anti-friction as possible, and the great simplicity and few parts in our Mills we can well be amused at the fine theories advanced by many to show that each has a mill more powerful than any other in the world.

It is also interesting to note how frequently some cross-roads mechanical genius has invented a mill that is not only more powerful than any other, but it is also more durable (the first and only one having just been erected,) and with some high sounding name it is proclaimed to the world as equally as good as the one made by B. S. Williams & Co., and a great deal cheaper, besides being constructed on some entirely new and scientific principle,—and we might add, with every probability indicating in most cases, that both the mill and the principle will pass away with the first trying wind they encounter.

Pumps.

In this Catalogue we present such pumps as have real merit, and will be found to meet all ordinary requirements.

Many pumps shown by pump manufacturers are only used now to a limited extent, or for some special purpose. Where pumps of this kind are needed, prices will be promptly given.

The different styles of pumps are designated by figures, and if parties ordering or writing will be sure to use the same figures we do, they will often save much trouble, and help to avoid mistakes.

We add a few suggestions which may, perhaps, assist some to better understand a few simple principles relating to raising water with pumps.

SIZE OF PIPES.

The size of the inlet, or suction pipe, should be about one-half the diameter of cylinder, and while the proper working of the pump may be interfered with by having inlet too small, yet if larger than really needed, it can do no harm. The discharge pipe is usually smaller than the inlet when a single-acting pump is used, but for pump with double-acting cylinder, it should be about the same size.

SUCTION.

It is important that the inlet, or suctiom pipe to a pump should be air-tight. In theory, water can be raised by suction about 33 feet perpendicular height; yet for various reasons we never recommend raising it in this way more than about two-thirds this distance, and, in fact, the shorter the suction pipe can be made, the better and more satisfactory will the pump be liable to work.

THE CYLINDER.

This is the important part of any pump, and it matters but little how elaborate or perfect may be those parts most exposed to view; if the cylinder, whether located within the barrel or body of pump, or near the bottom of well, and connected to top by pipes and rods, be not properly constructed, the whole pump will fail of giving satisfaction. Although it is necessary to have a cylinder long enough to admit of intended stroke, and is even an advantage, sometimes, to have it longer, yet it is not essential that stroke should be as long as cylinder.

PINE BUSH, ORANGE CO., N. Y., December 22, 1881.

B. S WILLIAMS & CO.: After using your Mill I must confess it exceeds my most sanguine expectations. It operates in the heaviest of storms with ease, furnishing my stock with an abundance of water and in creamery to cool the milk of 900 cows My cows will earn me 75 cents to $1.00 per head per month more than before. Three out of four of my neighbors say they must have one next summer, and you can sell a number of them. Yours respectfully, J. M. SMITH.

NAZARETH HALL, NAZARETH, NORTHAMPTON CO., PA.,
REV. EUGENE LEIBERT, Principal.
November 26, 1881.

MESSRS. B. S. WILLIAMS & CO.—*Gentlemen:* I am happy to report that the Wind Engine and Pump erected by you on our premises performs admirably. Although we have had comparatively but little windy weather since it has been in operation, it has done more than the work promised by you, and it is supplying more than three times the amount of water we require. It is a perfect success in every respect.

Very truly yours, EUGENE LEIBERT.

Wind-Mill Pump Standard.

This cut shows our new, improved Wind-Mill Pump Standard, such as we generally use, which is, without doubt, one of the best pumps made; works very easy by hand or wind power, and has come into general use in connection with Wind-Mills. We build these for 6 inch or 10 inch stroke cylinders, as ordered, and screw them for 1, 1¼, 1½, 2 or 2½ inch wrought iron pipe, as preferred. Always screwed for 1¼ inch, unless ordered differently. Give the number of feet from the platform of well to the bottom; and, if drilled, the diameter of the bore. They can be fitted here so that any one can put them in.

This Pump is used to raise water to surface only. The house tank is built to receive water from spout of the pump.

FIG. 585.

See page 19 for Cylinders to go with these Standards.

Force Pump.

This Pump is used to force water through hose for washing carriages, etc. Is NOT used where water is forced to an elevation and remains there. The working parts are all brass — as are other pumps — unless otherwise ordered.

The top revolves to any desired position, and is very heavy and strong, while the substantial brace serves to steady the Pump and hold it to its place securely. The gas pipe is connected in the body, close under the spout, and either 1, 1¼ or 1½ inch can be used, as ordered. On the extremity of spout we place a coupling and tube for 1 inch hose. We build these Standards for both 6 and 10 inch stroke.

FIG. 580.

We shall be happy at all times to answer any questions about Pumps, whether you want Wind-Mill Pumps or not.

See page 19 for Cylinders to go with this Standard.

The New 1884 Anti-Freezing Wind-Mill Force Pump.

For Elevating Water or Delivering it at Platform.

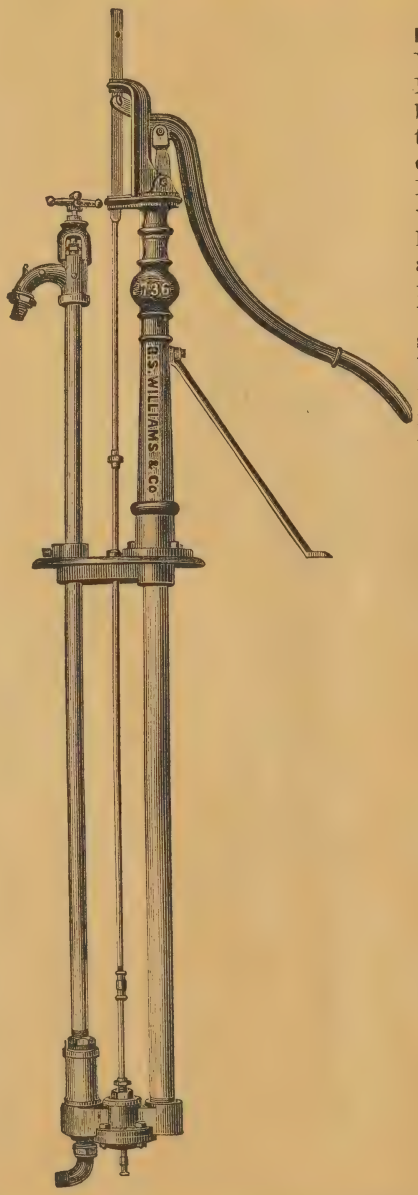


Fig. 736 represents our **Anti-Freezing Wind-Mill Force Pump,** with Vertical Distributing Valve, and Brass Elbow Attachment at the bottom outlet. This is one of the best Wind-Mill Force Pumps ever made. We use 1¼ inch Iron Pipe for the discharge, which is made in one piece and held in place with a set screw at the platform base, so that by merely unscrewing the coupling below and loosening the set screw at the base, the pipe can be pulled up and the valve and working parts examined and repaired, and the parts replaced without any trouble and in much less time than with other old style Pumps. We use 2 inch Iron Pipe for the Air Chamber, which is done to strengthen the set length and keep the working parts in perfect line with each other. At the bottom outlet we use a Brass Elbow Union Attachment, which is more convenient in making the regular pipe connections than any other way. We use a regular Brass Stuffing Box above the spout, which prevents all leakage when hose is connected. The valve is opened and closed by turning the wheel above the stuffing box, as shown in cut. The opening through the platform is made larger, and pipe can pass through without taking off the standard. We also use a *Malleable Union Conpling* for the plunger rod, which can be disconnected much easier than with the ordinary coupling. At the Lower Working Head it is so arrranged, that by merely unscrewing the

cap or attachment on top, a 2 inch or 2½ inch Plunger can be drawn through and so on up through the opening at the platform base, so that repairs can be made and plungers re-leathered without being compelled to disconnect the set length, etc.

Always fitted for ¾ inch Hose Coupling at the spout, and for 1 inch Iron Pipe at Brass Elbow Attachment. The bottom flange is always fitted for 1¼ inch Suction Pipe unless otherwise ordered. When fitted for 2 inch Suction Pipe we always furnish a malleable forked rod connection for Wood Rod unless otherwise ordered.

This Pump is made with 6 inch or 10 inch stroke, and may be used with tubular well or with any of the Cylinders shown on page 19.

Syphon, or Tom Thumb Working Barrel.

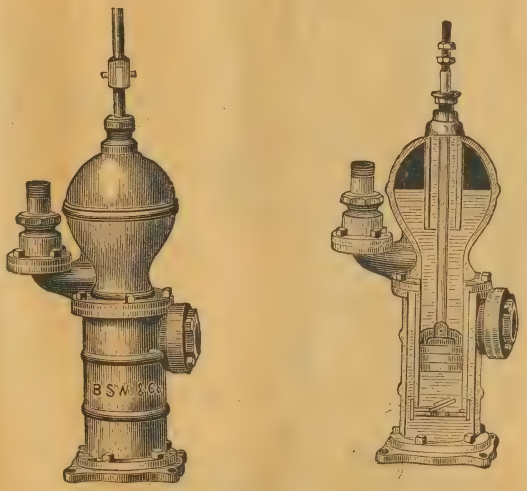


Fig. 514.

This is a very substantial Working Barrel for deep wells, or to force water from a spring, especially where there is a side suction. The induction pipe enters the outer barrel above the lower valve, thus leaving the check valve always primed. If water is drawn from one side, *always* use a nipple and union.

For Florists, Gardeners, Brickmakers, Liverymen, or where fountains or lawn-sprinklers are in use, this is, no doubt, the best pump to buy. Where the amount of water required is made known to us, we can give size of pump and pipe required. In drawing water from one side, as is frequently done at a spring, always use a foot valve.

Fig. 338 or 339.

Can be Arranged

FOR BOTH

Hand and Wind-Mill.

This represents, without a doubt, the best double-acting pump made in the country. The cylinders are all bored as smooth as any steam engine cylinder. The piston rod of bronze with solid cross-head. The valve-seats are of bronze and screwed in, and can be removed or put in. This is done without disturbing any other part of the pump, by simply taking off the cover or plate. The suction pipe can be easily detached. The pump is especially suitable for railways, distilleries, breweries or factories requiring a large amount of water.

FIG. 609.

FIG. 616.

CYLINDERS.

Bear in mind, the Cylinder is the Pump proper, no matter how attractive the top may be, the work is done by the cylinder. As before stated about pump tops, we only quote those cylinders that are in general use.

SIZES AND PRICES.

Figure 609—Iron.

No. 3—2½x9 in., for 1¼ in. pipe----------$3 75
No. 4—3x9 in., for 1¼ in. pipe---------- 4 00

Fig. 616—Brass Body or Shell, Brass Plunger Iron Attachments.

2½x10½ in., for 1¼ in.,----------$8 00
3x10½ in., for 1½ in.,---------- 9 00

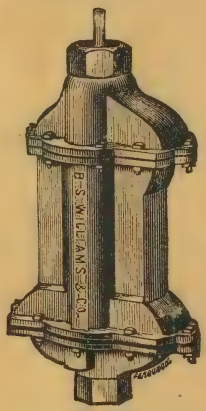


FIG. 621.

Figure 615 — Artesian or Drilled Well Cylinders.

We give inside diameter; calculate ½ or 9-16 more if to go in drilled well. Brass bodies, iron attachments.

FIG. 615.

No. 0—2x16 in., 1¼------$10 00 | No. 2—2½x16 in., 1½----$12 00
No. 1—2¼x16 in., 1¼---- 11 00 | No. 4—3x16 in, 1¼------- 13 00

Figure 621—Double Acting Cylinder.

No. 1—2¼ in., for 1¼ in. pipe----------$10 00
No. 2—2½ in., for 7¼ in. pipe---------- 11 00
No 4 - 3 in., for 1¼ or 1½ in. pipe---------- 12 00

All cylinders have oval valve seat in bottom attachment. Top or bottom attachment, 75 cents each.

In ordering any parts to cylinder, please designate the parts by name below and give the figure.

Body, or Shell of Cylinder.
Top Attachment. Bottom Attachment.
Plunger (meaning Plunger complete).
Bail, or Cage of Cylinder.
Follower, or Bottom of Plunger.
Valve.

PLATE 2.

"Harness the Wind."

Plate 2, taken from actual photograph, shows how, with one of our Mills, we "Harnessed the Wind" for an owner of suburban residence and grounds overlooking the Hudson River. We have represented a portion of tower broken away, exposing tank elevated therein. We also show the well with one of our Pumps, Fig. 514, directly under tower. It is only a question of convenience whether tank is placed in tower or on an elevation, as seen in Plate 1, or in any other location, so the supply reservoir is high enough to form a head of water; and the higher this supply is raised, the greater will be the pressure at the various openings where water is distributed. From this tower tank are pipes leading under ground to fountain in front of house, and pipes also lead to hydrants in various parts of grounds and conservatory. The tower on any such job may be made as fancy and expensive as desired, and forms both a support for Mill and an ornamental observatory, the top of which may be reached by winding stairs inside, and from which an excellent view of the surrounding country may be had. In this tower is placed an expensive clock, similar to a town clock in a church steeple. The Wind-Mill has, of course, nothing to do with this; but it shows one of the many ways these ornamental towers may be fixed up to suit the fancy of the owner.

Our Mill is no unsightly machine, but can be painted to match the surrounding buildings, makes no noise in its operation, and some of the finest residences and grounds in the country are supplied with water by one of these Mills.

The following from Mr. John Breitmeyer, a leading florist, at 157 Bates Street, Detroit, speaks for itself:

B. S. WILLIAMS & Co., Kalamazoo. Mich.—*Gents:* The Wind-Mill I purchased of you last November has proven to be all you claim for it. It will by a moderate wind run quiet, fast and pump all the water we are using daily in from six to eight hours time; we are consuming on an average 60 barrels a day. It is drawing water from four different wells, the farthest one being 170 feet distant from the place where the Mill is erected, and it works to my entire satisfaction. It will only require a little wind. It will pay for itself in a short time, as it does all the pumping one hand can do, thus saving me one man's wages all the year around. I would not be without it for triple its cost, and cheerfully recommend it to every one. Very truly yours, JOHN BREITMEYER.

Tanks.

Next to a good pump, perhaps appropriate Tanks might be classed as among the most essential requirements for a satisfactory Wind-Mill job. The Reservoir Tank is necessary to hold water to last, if for a time the wind should not blow. The House and Milk Tanks are almost indispensable to the kitchen and dairy-room, and Valve Tank for watering stock. We give herewith representations of some of the various styles of Tanks made by us.

FIG. 7.

RESERVOIR TANKS.

These are either round or square, and the round ones can be made any size desired. They are made of pine, painted on the outside, the square tank having three to four sets of oak gripes.

Figure 7 represents a small size, in common use, known as our 5x2 round tank. Figure 8 is larger, being 5½x3, and is one of the most popular sizes we make.

FOR FLORISTS OR GARDENERS

An elevated tank can be set in the tower and give water sufficient head for distribution by means of hydrants and hose. Such a plan is shown on page 20. The same thing will apply to

SUBURBAN RESIDENCES,

Out of reach of water works. Lawn sprinklers and fountains can be had, and all the benefits of an abundance of water secured.

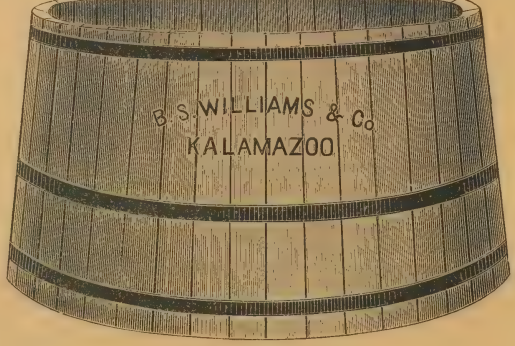


FIG. 8

ELEVATED TANKS.

Figure 9 shows a style of Tank we often make, to be elevated in the Wind-Mill tower. They are known as Tower Tanks, and are made of such form as to be adapted to shape of tower. To prevent water escaping where Mill pitman passes through bottom of tank, we use a piece of wrought iron tubing, having a long thread on one end, on which a lock-nut is first screwed far enough so the projecting end will reach through the bottom of tank, when another lock-nut is screwed up against under side of tank bottom, and upper nut is turned down snugly against upper side of same, thus forming a water-tight joint; the tubing projects upward same height as tank, and through this the Mill pitman works.

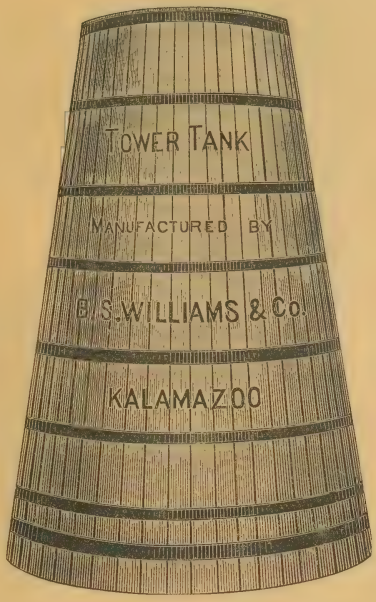


FIG. 9.

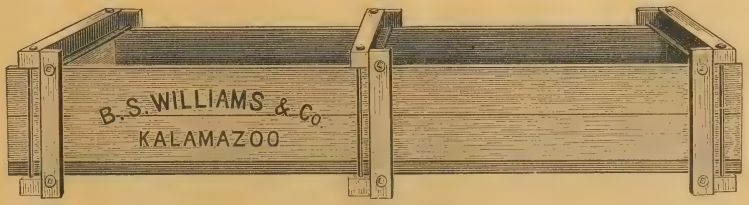


FIG. 10.

SQUARE RESERVOIR TANKS—FIG. 10,

Are usually made of three sizes—small, medium, and large—having two, three, and four sets, respectively, of oak gripes, which go entirely around the tank, and are held in place by iron rods. The cut represents the medium size, which is the one most used.

HOUSE TANKS.

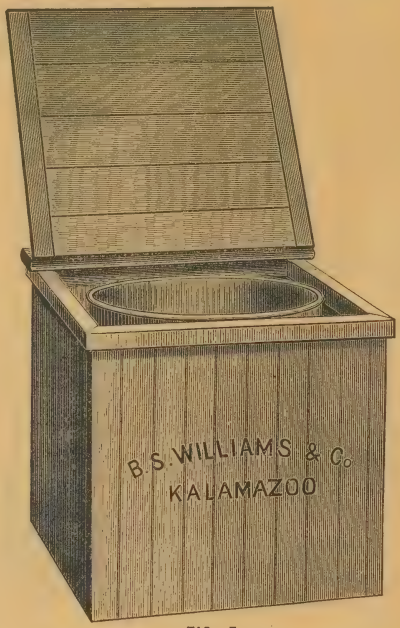


FIG. 5.

Fig. 5 represents our House Tanks, which can be set at the pump, on the porch, or inside the house. They are made of galvanized iron, cased with inch pine stuff, matched and beaded, with a lid to prevent dirt from blowing into them. This tank is used by the housewife, and being cased does not freeze. All the water pumped for any purpose runs through this tank, and it virtually takes the place of a spring. Where well is near enough to house to be convenient, the house tank is often placed directly under spout of pump, but where water is taken from well or spring that is some distance from house, all water can, by means of force pump, still be made to run through this tank, thus insuring a supply of fresh water for house use. Such an arrangement is illustrated on page 26, and more fully explained on page opposite. In same place is also illustrated and explained the use of

MILK TANKS.

There are hundreds of farmers who consider this very important, inasmuch as the water running around the milk vessels, gives the milk a temperature from which the best results are obtained, both as to the quantity of cream and the quality of butter made. This is also provided with lid to keep out dirt.

FIG. 6.

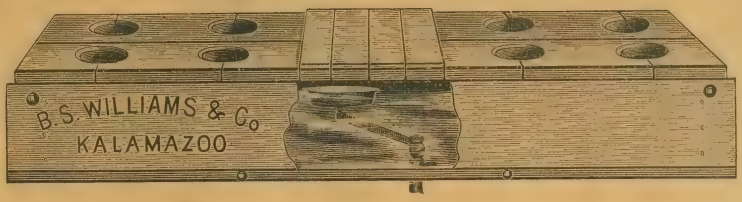


FIG. 11.

VALVE OR AUTOMATIC TANKS

Are made of two-inch pine, painted on the outside; the valve and float being covered to prevent animals getting at them. As soon as the tank is full, the water raises air-float attached to lever, which shuts water off until water is used, when the float dropping down, allows water to fill tank as used. We put these in at different places, and they are virtually a spring, where a man wants water without any mud, or the water going to waste.

Nothing can well be more simple, and at the same time more perfect in operation, than these Valve Tanks; being completely automatic, they require no attention when properly set; and, no matter how much water is used from them, they always remain full, but never run over. For the Farmer or Stockman, they are invaluable. The one shown in cut is provided with cover having openings; when arranged in this way they are called Hog Tanks; the object being to prevent hogs from getting into Tank, and yet allow animals to drink. Where no hogs are kept, this cover is left off, or a close hinged cover may be provided, that can be shut down when not in use.

We put in hydrants, so that buyers can have water at their horse barns, or other points where there is little room to spare.

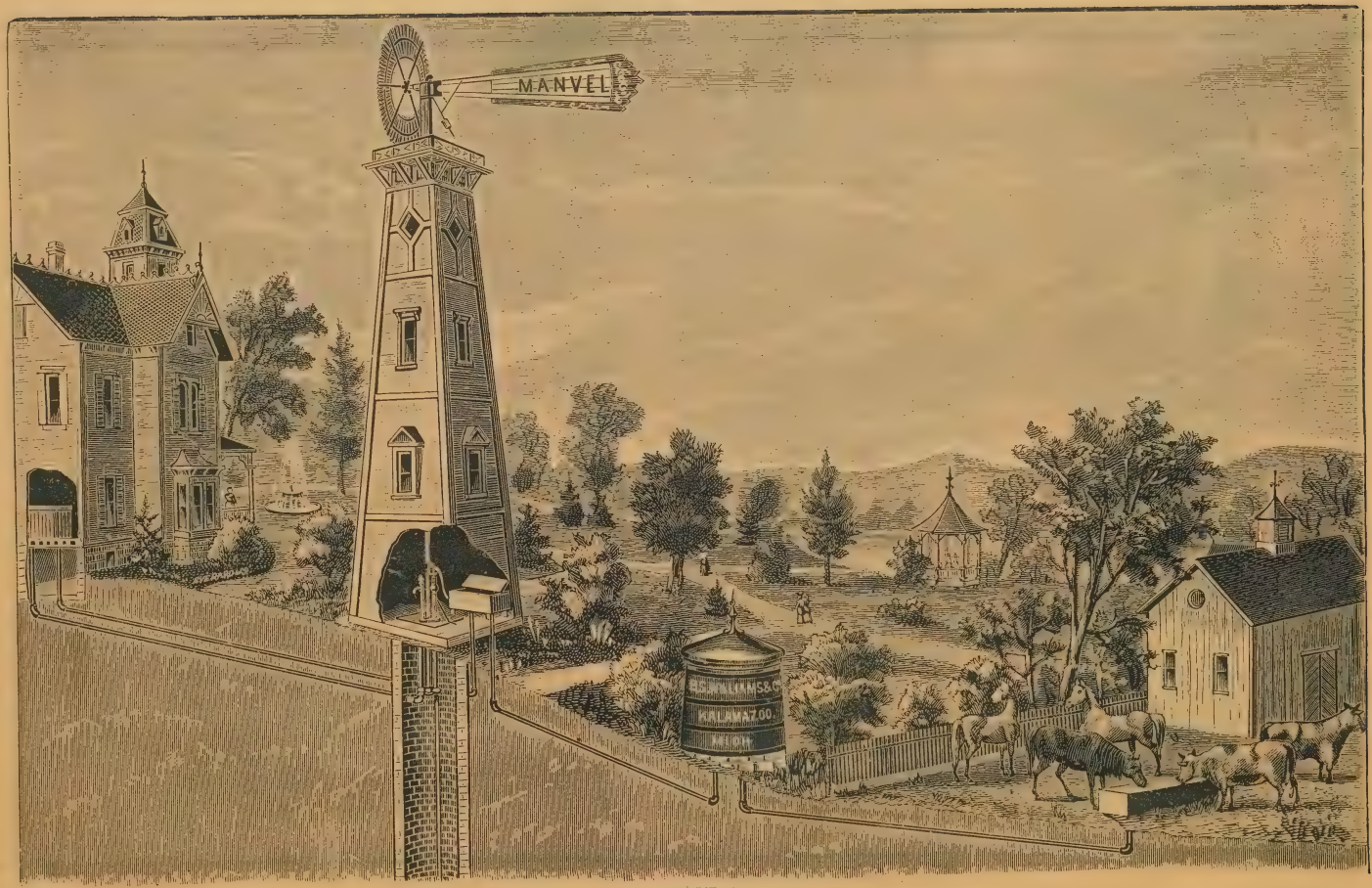


PLATE 3.

Explanation of Plate 3.

We have shown, with Plates 1 and 2, different methods for locating Tanks, Pipes, etc., where well is lower than some of the points where water is wanted. On opposite page is seen a plan for distributing water where Mill and well are on high ground. The tower being inclosed, the lower portion may be used as a convenient milk room. A part of the enclosure being broken away, shows Pump, Fig. 736, and Milk Tank, Fig. 6. From bottom of pump is pipe leading under ground and up through floor of house to House Tank, Fig. 5, in kitchen. Inside this tank is a stand pipe reaching to within a short distance of top of tank. When tank is sufficiently filled, the water overflows down through this stand pipe, and pipe leading back under ground to milk tank in tower. A similar stand pipe in milk tank allows it to fill to the desired height, when the water overflows down through pipe and under ground to reservoir tank. In this no stand pipe is used; but from the bottom of it is a pipe leading under ground to Valve Tank, Fig. 11, in barn yard. The top of valve tank being lower than bottom of reservoir tank, keeps the former full so long as any water remains in the latter. It will be observed that all water passes, while fresh and cool, through house and milk tanks, thus substantially making of each of these a living spring of water, always full, and yet never running to waste; the same water passing through large tank to valve tank forms a constant supply for stock, whenever and in whatever quantity they wish. A covering placed around large tank will keep the water cool in summer, and prevent freezing in winter. In many such jobs the house tank is placed directly at spout of pump. Where this is done, a Wind-Mill Standard, Fig. 585, may be used, doing away entirely with the necessity of any force pump. In fact, where Fig. 736 is used, it is not essential that Mill should stand on high ground; but with well or spring located in the low back ground, water could be forced to house tank equally as well, by having sufficient length of pipe. In a limited catalogue like this, it is not possible to set forth all the various devices or methods we use in connection with the Wind-Mill System of Water supply; but we have aimed to give a brief outline of what may be done with our Wind-Mills. We invite correspondence, with, as nearly as can be, a diagram showing where water is wanted, depth of well, amount of water in well, distance from well or spring to where water is to be delivered, amount required daily, etc. Recollect that a Wind-Mill must go high enough to get the full force of the wind in order to be effective. The fact that the trade in our Mill has largely increased every year since their introduction and that parties having used them from four to six years, and needing more mills, have bought of us, and paid more money than others could be bought for, is a sufficient guarantee of their worth.

In our State alone, we will venture to say that there have been over thirty different mills made since we started trade that are not in existence to-day.

Our Mills erected 8 and 10 years ago are working now; the farmers of Michigan, Ohio, New York, and many other States, have found that there is as much difference in Wind-Mills as there is in horses, and with our facilities, experience and capital, we shall continue to make Wind-Mills that will stand years of service, fully protected by licenses from bottom patentees, and fully warranted.

Suggestive Questions.

Did you ever notice any farmer that had to leave his plow in the field, and go and water his stock?

Did you ever see stock on a farm lowing for water until the housewife got so tired of it that she went to work and drew the water for them, rather than see them suffer from thirst?

Did you ever see stock break out of their pasture because they wanted water, and thereby, finding how easy it was to break through their enclosures, become unruly creatures, and only fit for the butcher?

Did you ever attempt to estimate the shrinkage in stock of any kind where they lacked the water they require?

Did you ever see a flock or herd where the supply of water was dependent on any one boy or man (if more than one it is generally worse for the cattle) get the amount of water they require?

Did you ever see the estimate of the loss on cattle alone through Central Illinois during the extremely dry time of 1881?

Did you ever notice stock driven by men on horseback long distances through the heat and dust to water *once every twenty-four hours?*

Did you ever suggest to the owner of such stock that, by using some of the wind passing over his farm, his stock can obtain water *any* time they want it and *all* they want by putting up a good Wind-Mill; and that such Wind-Mill will not cost him one half what his time is worth getting water by pumping or by driving stock to a distance?

Did you ever notice that some of the best stockmen buy our Mill and then eventually get from two to four more, according to the amount of land they own.

Did you ever notice that when a party has used a Wind-Mill and makes a change to a farm that has none on it, he buys a Wind-Mill among the first improvements he makes on his new home?

Did you ever realize that by using a Wind-Mill all the water can be forced through the house, milk tank or creamery, and thence by means of pipes to different fields, where, by using a valve tank, you substantially place a living spring of water before your stock, without having a foot of waste land?

Did you ever think that the spring water you have 30, 60 or 100 rods from your house, or the well water, no matter how far below the surface, can be delivered in your house or at your door?

Did you ever notice that a first-class Wind-Mill is perfectly self-regulating, running no faster in a 20-mile wind than in a 12-mile wind; that it is something used *every* day in the year; that it works night and day, regardless of storms, only needing a little oil occasionally?

Did you ever think that the wind can be your servant, working night and day without fuel, food, wages or instructions, never striking or getting tired?

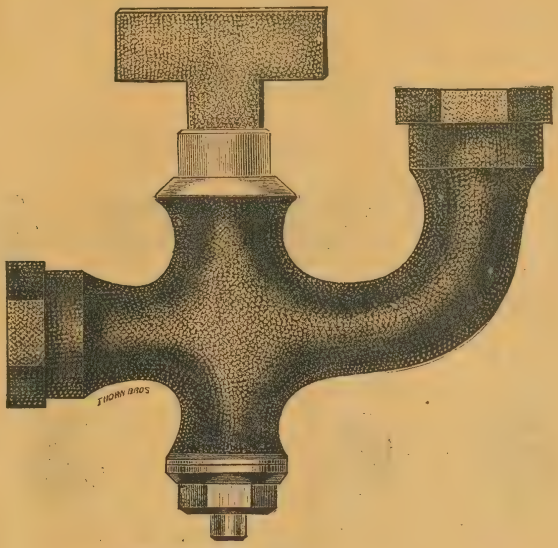
Did you ever hear of **B. S. WILLIAMS & CO., Kalamazoo, Mich.**, who are among the oldest manufacturers of Wind-Mills, and whose trade has increased each year until now they have the largest home and foreign trade of any concern in the country?

Did you ever think it was any advantage to buy goods of established reputation and from a concern that has all the advantages of capital, experience and patents, rather than some experiment that is an "improvement," so called?

Did you ever stop and think a moment that the claims of these owners of "improvements," of "more power," and "as cheap as B. S. WILLIAMS & Co. sell," "made nearer home," do not amount to anything, as the power is nearly alike on all wheels of same size? B. S. WILLIAMS & Co. sell Mills as cheaply as first-class ones can be sold, and their Mills are *at home* wherever water is used and wind blows.

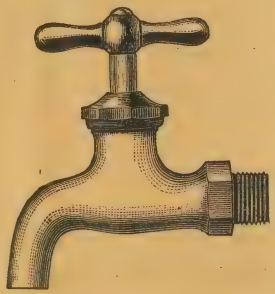
Did you ever write, stating amount of water required daily, and whether from a well or spring? If not, hadn't you better?

Fig. 12.



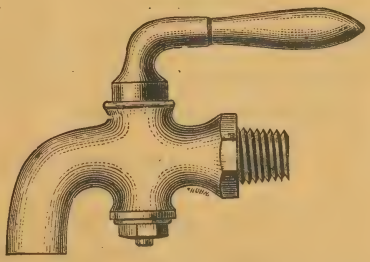
Hydrant Cock.

Fig. 13.



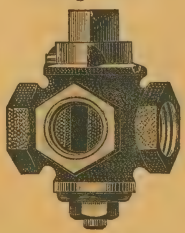
Compression Bibb Cock.

Fig. 14.



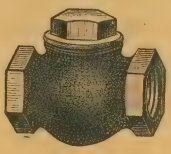
Lever Handle Bibb Cock.

Fig. 15.



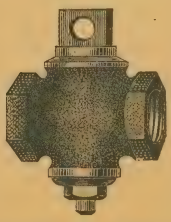
Three-Way Cock.

Fig. 16.



Check Valve.

Fig. 17.



Service Cock.

Fig. 18. Fig. 19. Fig. 20. Fig. 21. Fig. 22.

Tee.

Elbow.

Bushing.

Cap.

Union.

Fig. 23. Fig. 24. Fig. 25. Fig. 62.

Locknut.

Reducer.

Coupling.

Nipple.

Above are shown some of the Pipe Fittings; and on preceding page some of the Brass Goods most commonly used, the cuts, together with the names given under each, affording a sufficient explanation of their uses.

ARE THESE MILLS DURABLE?

The turn-table of our Mill is chilled iron. The boxes are lined with the best Babbitt metal, all pieces of wood are painted before they are put together, the arms are firmly bolted in the hub, and the nuts locked, and the sections are also bolted and locked to the arms and to each other. We have never seen a wheel so fixed to stay as ours. Each Mill is finished and painted to wear, and has but three joints to work the entire machine.

Testimonials.

In our walks about town we notice quite often now at the works of B. S. Williams & Co. Wind-Mills boxed for foreign shipment, and our townsmen are working up a good trade in South America, Australia, and South Africa. When sent to the latter place they have the lumber sent from here for the towers. Good for Yankee enterprise! Michigan pine set up in South Africa with a Kalamazoo Wind-Mill on it, isn't bad, and shows that one of the leading industries of the town is spreading to the four corners of the globe.—*Kalamazoo Daily Telegraph.*

At the solicitation of many of our agents, we insert in our Catalogue a few testimonials from parties in different States, and they are from practical and well-known men. B. S. WILLIAMS & CO.

The following is from Hon. E. O. Humphrey, late President Michigan State Board of Agriculture, and the Mill spoken of is still doing good service, and bids fair to continue many years:

B. S. WILLIAMS & CO.—*Gentlemen:*—The Wind-Mill put up by you at my residence in the spring of 1876, has proven to be fully equal to the recommendation of the same. It forces water up an elevation of 65 feet into the top of my carriage house, which is situated about twelve rods from the well, and furnishes water in abundance for my stock-yard, horse-barn, and six hydrants for watering my grounds. After having considerable experience with other mills, I am of the opinion that your Mill is one of the best in use.

Very truly yours, E. O. HUMPHREY.

This is from Hon. D. W. Wiley, prominent as a fruit grower, on Michigan Lake Shore:

B. S. WILLIAMS & CO., Kalamazoo, Mich.: You ask my opinion of the Wind-Mill on the Lake Shore. One of your Mills has been under my eye, you might say, for over three years, and from my observation, and from what Mr. Kyle says, I know it is doing the work to his entire satisfaction, and stands the storms incident to the Lake Shore, as it stands less than one mile from the beach.

The recent storm was the worst I ever saw in my seven years experience on the Lake Shore. It unroofed buildings, tore trees out, and was disastrous to many orchards on the Lake Shore, and I must confess that I as well as every one in that neighborhood, was surprised to see the Mill standing after that storm.

From inquiry a few days ago, I learn that not a dime has been paid for repairs since erection. I am confident they will stand any storm.

D. W. WILEY.

B. S. WILLIAMS & CO.: The Wind-Mill is working in No. 1 style. As you know it is about two miles from my house, yet I know my cattle get all the water they want. When I salt my cattle, I oil my Mill, and let it go the rest of the time. Storms don't seem to make any difference with it.

I am, respectfully, JONATHAN CARMINE.

GREECE, N. Y., August 23, 1881.

GENTLEMEN: Your Mill works admirably. I never realized that it would please me as well. I took a great deal of your agents' talk, and made all due allowance for their exaggeration, but I now acknowledge that it was not overstated. I would not think of farming without my Wind-Mill. Yours respectfully, D. K. ROBINSON.

MR. A. B. ALMOUR, Halifax, N. S. DEAR SIR: This is to certify that the eight Patent Wind Pumping Mills, that you erected at the different watering stations along the line of railway last summer have given every satisfaction. They have stood very severe storms without any damage, are easily managed, requiring to be oiled only once or twice a week, which is done by the section men. Their average capacity is about 1,500 gallons per hour, in moderate winds. They are easily and quickly changed from power to hand pumping in case of calms. I can confidently recommend them for railroad purposes, or for pumping purposes where a steady supply of water is required. Yours truly,

GRANDVILLE C. CUNNINGHAM, Resident Engineer.

The above is our twelve-foot Mill, and is working on double-acting pump 1½ inch suction, and 1¼ inch discharge.

Office FULLER BROS., Wool Hat Manufacturers,
MIDDLETOWN, N. Y., December 2, 1881.

Please find enclosed check, amount of bill. Acknowledge receipt of check. The Mill works like a charm and I can recommend it.

Yours truly, G. B. FULLER.

PLAINFIELD, N. Y., December 28, 1881.

MESSRS. B. S. WILLIAMS & CO.: The Mill you put up for me nearly two years ago is in good order, and has done all you said it would. There has not been a day since it started that I have not had an abundance of water. It supplies my house, my father's house, horse-barn, carriage house, barn yard, pasture field, and four hydrants, and I believe it has capacity to supply double the amount, as I allow it to pump not more than one third the time. There is no investment I have ever made that has satisfied me so well for the amount invested, and I am glad to say to anyone who will buy one of your Mills he will be thoroughly satisfied with it. Yours respectfully, C. R. MALTBY.

BANFIELD, BARRY CO., MICH., December 20, 1881.

GENTS: There can be six, possibly seven Mills sold in my neighborhood, as there were quite a number of cheap Mills sold here about two years ago, and they never satisfied the buyers. My Mill has run seven years and has whirled every day without a cent of expense to me since it was first put up. What will you charge me for six 10-ft. mills?

Yours truly, I. H. WICKWIRE.

The above is from a county where they "know what the wind was made for," as the wells are from 80 to 160 feet deep, and nearly every man has some kind of a Mill. We shipped eleven to nearest R. R. Station within three weeks of date of above letter.

RED KEY, JAY CO., IND., April 14, 1881.

B. S. WILLIAMS & CO.—*Gentlemen:* Please ship me one of your ten-foot Mills. I have been trying one of the———mills, but shall not have anything more to do with it, as the four mills bought of you in 1874 are doing good work to-day. Yours truly, J. B. KINNEY.

CONEWANGO, CHAUTAUQUA CO., N. Y., Dec. 22, 1881.

I cannot understand why more of our dairymen do not use a Wind-Mill. I would not think of doing without one, especially in such a dry season as the past one. It has paid me, and I know it will pay any dairyman who cannot run a spring through his barnyard.

Yours respectfully, H. ALDRICH.

CUTLER, IND, APRIL 18, 1881.

MESSRS. WILLIAMS & CO.: The Mill I bought of you two years ago works first rate, and I can recommend it highly. Yours, etc.,

GEO. W. SHANKLIN.

CHURCHVILLE, N. Y., Oct. 18, 1881.

B. S. WILLIAMS & Co., Kalamazoo, Mich.:

It was a surprise to me, and I think it is to every one that buys a Wind-Mill, to find how little trouble they are, and how much better they do their work than was anticipated. If people would only stop and consider a short time, they would see that there is not a single tool, from a jack-knife to a binder, that is more useful than a good Wind-Mill. I use my Wind-Mill more days than I do my knife, and predict their universal use all over the country. Yours very respectfully,

CHARLES A. PALMER.

ROCHESTER, N. Y., February 1, 1882.

MESSRS. WILLIAMS & CO,: In my gardening business I find the Wind-Mill pays me very well, as there are times when a little water saves the life of thousands of plants. With an elevated tank it is short work to water a large number of plants, the water being pumped when I am asleep or at work. Respectfully, WM. COOPER.

DUTCH NECK, N. J., June 18th, 1884.

B. S. WILLIAMS & CO, Kalamazoo, Mich:

Enclosed find check in payment for my Wind Pump, which works splendidly, and gives me all the water I need. I would not be without the Mill for three times what it cost. Yours truly,

WM. P. WALTON.

WILLISTON, VT., Feb. 25th, 1884.

B. S. WILLIAMS & CO., Kalamazoo, Mich.:

The Wind-Mill I purchased of your agents, J. A. Watts & Son, is doing all you promised. I am using it to water from 15 to 20 horses and 125 cows giving all the water I want; but this fails to express one-half the satisfaction we have in its use. Yours, etc.,

L. H. FALCOTT.

SHOREHAM, VT., March 26th, 1884.

B. S. WILLIAMS & CO., Kalamazoo, Mich.

The Manvel Wind-Engine I have cannot be surpassed for strength, durability, workmanship, and ease with which it regulates itself in high winds, at same time workng with uniform motion. The Break-Shoe is a very simple and effective device. I would recommend your Mill above all others that have come under my observation.

Yours respectfully, J. T. STICKNEY.

NORTH HERO, VT., March 5th, 1884.

B. S. WILLIAMS & CO., Kalamazoo, Mich.:

In regard to the Wind-Engine I purchased through your agents, J. A. Watts and Wm. H. Hyde, I would say that it is the best investment I ever made, as it is the most labor-saving machine I ever placed on my farm, doing away with water-holes cut through the ice, (a work I have been obliged to do every winter for over 25 years,) now bringing the water from Lake Champlain into my yard in a most acceptable manner. Would recommend your Mill to all. Respectfully yours,

B. C. BLANCHARD.

These are only a few among hundreds of letters we have; but the satisfaction is the same as expressed in the above letters.

B. S. WILLIAMS & CO.

E. H. EVERARD & CO., JOB PRINTERS, KALAMAZOO.